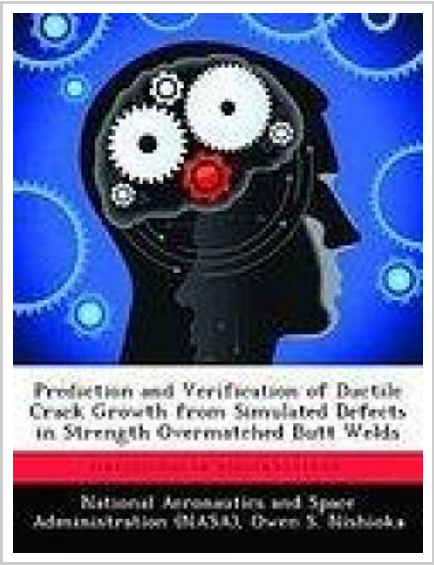

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Prediction and Verification of Ductile Crack Growth from Simulated Defects in Strength Overmatched Butt Welds

By National Aeronautics and Space Administration (NASA)

Bibliioscholar Mrz 2013, 2013. Taschenbuch. Book Condition: Neu. 246x189x10 mm. This item is printed on demand - Print on Demand Neuware - Defects that develop in welds during the fabrication process are frequently manifested as embedded flaws from lack of fusion or lack of penetration. Fracture analyses of welded structures must be able to assess the effect of such defects on the structural integrity of weldments; however, the transferability of R-curves measured in laboratory specimens to defective structural welds has not been fully examined. In the current study, the fracture behavior of an overmatched butt weld containing a simulated buried, lack-of-penetration defect is studied. A specimen designed to simulate pressure vessel butt welds is considered; namely, a center crack panel specimen, of 1.25 inch by 1.25 inch cross section, loaded in tension. The stress-relieved double-V weld has a yield strength 50% higher than that of the plate material, and displays upper shelf fracture behavior at room temperature. Specimens are precracked, loaded monotonically while load-CMOD measurements are made, then stopped and heat tinted to mark the extent of ductile crack growth. These measurements are compared to predictions made using finite element analysis of the specimens using the fracture mechanics code Warp3D,...

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